

Claims

1. A method for optimizing lifetime of an OLED display element, the OLED display element comprising a plurality of addressable discrete OLED pixels, each of said OLED pixels being driven by a supply voltage and a drive current provided by a current driver, each OLED pixel having a threshold voltage, the method comprising, for an OLED pixel:
 5 determining an environmental parameter which affects aging of an OLED pixel, determining a first operational parameter indicative of aging of the OLED pixel, and compensating at least partly for aging by changing a second operating parameter of the OLED pixel based on the determination of the environmental parameter and the first operational parameter.
2. The method according to claim 1, wherein the second operational parameter is at least one of on-time of the current driver or supply voltage to the OLED pixel.
3. The method according to claim 1, wherein the environmental parameter is
 15 obtained by measuring a temperature of the OLED pixel.
4. The method according to claim 1, wherein determining the environmental parameter includes measuring an ambient temperature and estimating the temperature of the OLED pixel from the measured environmental temperature.
5. The method according to claim 1, wherein the first operational parameter is
 20 obtained by measuring a voltage across the current driver to determine the threshold voltage or normal operating voltage of the OLED pixel.
6. The method according to claim 1, furthermore comprising measuring the voltage across the current driver to determine a change in time duration required for a voltage across the OLED pixel to attain its threshold voltage or its normal
 25 operating voltage.
7. The method according to claim 4, furthermore comprising storing the measured temperature for each OLED pixel.
8. The method according to claim 6, furthermore comprising storing the measured voltage across the current driver for each OLED pixel.
- 30 9. The method according to claim 1, furthermore comprising determining an optimal pre-charge required for each OLED pixel.
10. The method according to claim 9, wherein determining an optimal pre-charge comprises determining an OLED drive voltage.

11. The method according to claim 1, wherein the method is applied to a tiled display comprising a plurality of OLED display tiles.
12. The method according to claim 11, furthermore comprising means for reducing temperature differences over two different OLED display tiles.
- 5 13. The method according to claim 12, wherein reducing temperature differences over two different OLED display elements comprises adjusting a cooling.
14. The method according to claim 1, wherein intensity and contrast of OLED pixels are set within predefined limits to reduce aging of the OLED display element.
15. An OLED display element, the OLED display element comprising a plurality of addressable discrete OLED pixels, each of said OLED pixels being driven by a supply voltage and a drive current provided by a current driver, each OLED pixel having a threshold voltage, wherein the display element further comprises:
10 means for determining an environmental parameter which affects aging of an OLED pixel,
15 means for determining a first operational parameter indicative of aging of the OLED pixel, and
means for compensating at least partly for aging by changing a second operating parameter of the OLED pixel based on the determination of the environmental parameter and the first operational parameter.
- 20 16. The display element of claim 15, wherein the means for determining an environmental parameter is a temperature measurement means for measuring the temperature of an OLED pixel.
17. The display element of claim 15, wherein the means for determining an environmental parameter is a temperature measurement means for measuring an ambient temperature, further comprising means for estimating a temperature of the OLED pixel from the ambient temperature.
- 25 18. The display element according to claim 15, wherein the means for determining a first operating parameter is voltage measurement means for measuring a voltage across the current driver to determine the threshold voltage or normal operating voltage of the OLED pixel.
- 30 19. The OLED display element according to claim 15, wherein the compensation means changes at least one of on-time of the current driver or supply voltage to the OLED pixel.

20. The OLED display element according to claim 16, further comprising a memory element for storing the measured temperature for at least one OLED pixel.
21. The OLED display element according to claim 18, further comprising a memory element for storing the measured voltage across the current driver for at least one OLED pixel.
22. The OLED display element according to claim 15, furthermore comprising a pre-charge adaptation means.
23. The OLED display element according to claim 22, wherein the pre-charge adaptation means comprises means for determining an OLED drive voltage.
24. The OLED display element according to claim 15 in a tiled display comprising a plurality of OLED display tiles.
25. The OLED display element according to claim 24, furthermore comprising means for reducing temperature differences over two different OLED display tiles.
26. The OLED display element according to claim 15, furthermore comprising means for setting intensity and contrast of OLED pixels within predefined limits to reduce aging of the OLED display element.
27. The OLED display system comprising a set of tiled OLED display panels, wherein each display panel is as in claim 15.
28. A control device for controlling an OLED display element comprising a plurality of addressable discrete OLED pixels, each of said OLED pixels being driven by a supply voltage and a drive current controlled by the control device, each OLED pixel having a threshold voltage, wherein the control device comprises:
 - means for determining an environmental parameter which affects aging of an OLED pixel,
 - means for determining a first operational parameter indicative of aging of the OLED pixel, and
 - means for compensating at least partly for aging by changing a second operating parameter of the OLED pixel based on the determination of the environmental parameter and the first operational parameter.